

## DOMES OF ARCHITECTURAL MONUMENTS IN UZBEKISTAN REPAIR AND RESTORATION EXPERIENCES

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### Abstract

*This article briefly covers the experiences of folk craftsmen who have carried out many works on the repair and restoration of the domes of architectural monuments. obvious to all.*

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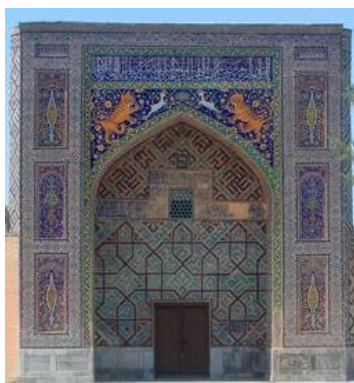
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Enter. Today, the works of selfless folk craftsmen, known for their art and work style in the repair of architectural monuments, are highly respected. One of the well-known renovation architects, master Abdugafar Haqkulov from Samarkand, dedicated his nearly half-century of life to the renovation of historical monuments, tiling and engineering works [1].

Abdugaffar Hakkulov, the founder of the Azim Samarkand School of Renovation in the 70s and 80s, emphasizes the need to pay great attention to the process of renovation works. In his book "The Art of Repair" (Tashkent, 1991), the master repairer A. Hakkulov writes with regret that some repair works in our republic are carried out in a haphazard manner, without following the project. [2].

The main part. As an example of the process of repairing domes, we can point out the collapse of large-scale bricks used in the repair of some monuments in Samarkand in 1985 and in Bukhara in 1987. The master repairer considers one of the main reasons for the reduction of the life of architectural monuments at present to be the moisture that spreads from the roof of their upper part. It offers a light and economical way to renovate their roofs in a modern style against moisture, and he himself uses this method during the renovation of the Nadir devonbegi ("Sherdori berun") madrasa in Samarkand. [3].



From the works of master A. Hakkulov  
(Nadir Devonbegi madrasa before and today)

In addition, the wall is made at a height of 40-50 cm from the upper part of the dome of the cells, reinforced concrete is laid on it with a thickness of 8-10 cm, and a pipe with a diameter of 10 cm is cut from various places between the concrete and placed vertically. They are designed for air entry into the rooms from above, and holes are left for wind entry from both ends of the common roof. [4]. Then, with the help of a cement mixture, a square brick and a reinforced concrete cover are plastered. In this method, money is spent several times less than the old one, and since the upper part of the building is always dry and light, its life will be eternal. After this experiment, which was carried out in the Madrasah of Nadir Devanbegi in Samarkand, gave good results, it was widely used to dry the roofs of monuments and extend their life.

Abdug'afar Hakkulov determines the causes of moisture in the upper part of the roof of ancient monuments and suggests ways to combat it. He also identifies the reasons for the shedding of the "gold patterns" repaired on the ceiling of the Tillaqori Mosque in Samarkand, and shows how to work to prevent them from shedding in the above-mentioned book "The Art of Repair". The master repairman showed how to make an additional foundation for buildings with a shallow foundation and how to strengthen them, how to restore them to their original state without damaging the walls and gables of the monuments, and he was the first to use these techniques. Nadir used it in the repair of the walls, facades and foundations of the Devonbegi madrasa. We see that Abdugafar Hakkulov was also a talented engineer. [5].

In his book "The Art of Repair", the master tiler explains how and what soil to choose for tile clay, how to wash the selected soil in what water and in what manner, how to make good clay from the washed soil, and how to cut the clay for tiles. , explained in detail how to select and fire the clay of the cut tiles, and how to paint and re-fire the baked terracottas.

It is known that since ancient times, koshinburish-koshin boards have been widely used for polishing buildings. Abdug'afar Hakkulov, a skilled repairer, mastered the complex art of making tile patterns, boards, and cutting eyebrows. In doing so, he embodied three tasks in himself - the tasks of a designer, painter and calligrapher. It is not an exaggeration to say that brickwork is a mirror of the art of architecture in the creation of the world of sophistication. Abdug'far Hakkulov was the father of this art. Otakhan revealed the wisdom of "angob" in master tile making and tile bending and rediscovered it for his time.

"The polishing of the surface of the tiles by waves is the wisdom of the Angob," writes A. Hakkulov. The composition of the angob is basically the same as the white color on which the tiles are applied. [6]. Only it is made liquid compared to white. The purpose of the liquid preparation of angob is that when it is applied to porous terracotta, it settles in the pores of the terracotta and is absorbed into the core.

Due to the soft nature of the angob, the paint applied to it quickly absorbs the angob and begins to blend in. One of the best features of angob is that because of its white color, any paint applied over it, especially purple (lajuvard), blue zainabi (nosi), will be extremely elegant and transparent. It also acts as a "consolidator" in the combination of terracotta and glaze-paints. For example, in order to join two irons, blacksmiths heat them up and sprinkle tanner on their faces, then join them. Angob and paint will never separate from each other after such a combination. Even if there is a push, the paint will move along with the terracotta. Another one of the best values of angob is that the applied koshin is baked three times in a khumdan, that is, first, terracotta is prepared, after angob is applied to it, it is baked again in the oven, and finally, the main (secret) paint is applied and baked again.

As a result, the tile will be extremely tough. In this way, Angob not only brings out the elegance of tiles, but also plays a key role in shaping their quality and longevity. "Angob coated tiles and tiles are resistant to any cold and moisture and do not lose their properties." [7].

If angob is first applied to the majolica and terracotta of all types of ceramics used in architecture and life, and then the desired paint is applied, it will definitely give the above effect.

The master repairer suggests adding 40-50 g of shires glue per 100 kg of ganch to increase the strength of the ganch mixture and preserve it for centuries. "When the mixture of ganch and shires juice hardens,

shiresh glues the pores of the ganch, inside and outside with its own juice [8]. Shiresh is made from a natural plant and was used as a glue in ancient times. Even if the ganch mixture prepared in such a mixture is dropped in water, it will not absorb water for a long time. It is known that ganch will never weaken if it does not absorb water. [9].

"One of the good features of ganch is its elasticity. Ancient architects, who understood this well, used ganch from buildings to domes. Monuments restored with stone and brick will last a long time and will not suffer much damage even in any conditions and terrible earthquakes. Because it is not brittle, it does not break, due to its elasticity, it self-absorbs imperceptibly even in a big impact," explains the architect.



Nadir Devonbegi madrasa repaired by master A. Hakkulov

Its condition in 1930 (historical photo) and its current condition.

On the southern borders of the city of Samarkand is the architectural complex of Khujah Ahrori Vali. The complex includes a shack, a madrasah, 2 winter mosques, 2 summer mosques, a minaret, and a pool.

The wall is built at a height of 40-50 cm from the upper part of the dome of the cells, reinforced concrete is laid on it with a thickness of 8-10 cm, and a pipe with a diameter of 10 cm is cut from various places between the concrete and placed vertically. They are designed for air entry into the rooms from above, and holes are left for wind entry from both ends of the common roof. Then, with the help of a cement mixture, a square brick and a reinforced concrete cover are plastered. In this method, money is spent several times less than the old one, and since the upper part of the building is always dry and light, its life will be eternal. After this experiment, which was carried out in the Madrasah of Nadir Devanbegi in Samarkand, gave good results, it was widely used to dry the roofs of monuments and extend their life.

The main building of the complex is an apartment house built at the end of the 15th century. In 1630-38, the Prime Minister of Bukhara Emirate, Nadir Devanbogi, built a mausoleum consisting of a room and a classroom on both sides of the building, facing east, using the building as a courtyard. The madrasa is one-story, the entrance is two-story, and on the second floor there is a library, similar to Bukhara madrasas, and the symbols of a lion and a fleeing ox are depicted on the main pediment, similar to the pediment of the Sherdord madrasa. The dome of the winter mosque in the Khujah Ahror complex is a double dome, it was built in the style of a dome wheel (sterlchatiy), with a square base and jamb shape, with four intersecting arches and corners. He painted it with ganch mixture.

The outer, i.e. the second, dome was built using the Mekhrobi dome method. The dome is finished with tiles. The plinth is decorated with Islamic Arabic inscriptions.

Summary. Abdugaffor Hakkulov created his own school of repair architects in Samarkand, coached it, trained many repair masters not only for the Republic, but also for Central Asia. He initiated the complete renovation of the Nadir Devonbegi madrasa in Samarkand and recreated this monument, which had become

a monument, in its original form for our people. In the course of this complex work, he made a number of inventions in the field of repair art and engineering. Summarizing his work experience, he wrote two rare books for the school of architects - "Repair of Historical Monuments" (Tashkent, "Teacher", 1983) and "Art of Repair" (Tashkent, "Mehnat", 1991 .) wrote down his works. These books, written in Uzbek, are considered the most unique educational manuals on the repair of architectural monuments even today.

In 1984, Abdugafar Hakkulov was awarded the title of "Honored Cultural Worker of Uzbekistan" for his great work. Otakhan's work is continued by his son and apprentice.

Among the tools of repairmen, tesha, obtaroz (water knife), shovel, gazchop, andava, patakbindi, sturgardon and guniya (corner) are still widely used in practice today.

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